

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of June 26, 2003 is respectfully requested.

As an initial matter, the specification has been slightly amended as indicated above in order to make idiomatic changes and in order to provide antecedent basis for new claim language used in the amended claims. However, it is submitted that these changes are directed only to matters of form and, therefore, no new matter has been added. Therefore, the Examiner is respectfully requested to enter the changes to the specification.

The Examiner has rejected claims 1, 3-4 and 8 as being anticipated by the Cook reference (USP 4,997,775); and has rejected claims 6 and 7 as being unpatentable over the Cook reference in view of the Kawakatsu reference (USP 4,731,341). However, independent claim 1 has now been amended as indicated above so as to clarify the distinctions between the present invention and the prior art. In addition, dependent claims 9-11 have been added so as to provide further distinctions between the present invention and the prior art. Finally, new independent claim 12 and dependent claims 13-17 have been added. For the reasons discussed below, it is respectfully submitted that amended independent claim 1, new independent claim 12, and the claims that depend therefrom, are clearly patentable over the prior art of record.

Independent claim 1 has now been amended to recite that the base region is formed as a single region *having a uniform impurity concentration with respect to a width direction of the base region*. The amended portion of claim 1 is explained at the top of page 4 of the specification.

The Cook reference discloses that a base region 66, 68 is created by diffusing dopant impurities downward into layer 16 (see Figure 6 and column 5, lines 12-24). However, the Cook reference does not disclose or even suggest that the impurity concentration of the base region 66, 68 is uniform with respect to a width direction of the base region. Consequently, it is submitted that amended independent claim 1 is not anticipated by the Cook reference.

The Kawakatsu reference discloses a method of fabricating a bipolar semiconductor integrated circuit device, but also does not disclose or suggest a base region formed using epitaxial growth technology, in which the base region has a uniform impurity concentration with respect to a width direction thereof. Therefore, one of ordinary skill in the art would not be motivated by the

Kawakatsu reference to modify the Cook reference or to combine the references in a manner that would result in the invention of independent claim 1. Accordingly, it is respectfully submitted that independent claim 1 and the claims that depend therefrom are clearly patentable over the prior art of record.

New independent claim 12 is directed to a method of manufacturing a semiconductor device, including forming a collector layer of a first conductivity type, and forming a base region of a second conductivity type on a top surface of the collector layer, in which the first conductivity type is opposite the second conductivity type. The base region is formed using epitaxial growth technology *while adding dopant during epitaxial growth* so as to obtain the second conductivity type. As a result, it is not necessary to use conventional methods such as ion implantation or thermal diffusion to form the base region having a conductivity type opposite the conductivity type of the collector layer. Therefore, variation in the width of the base region can be significantly reduced as compared to base regions of semiconductor devices manufactured using conventional methods such as ion implantation or thermal diffusion.

The Cook reference discloses that a layer 16 is grown in a conventional epitaxial growth reactor (see column 3, lines 46-49), and then a base region 66, 68 is formed by diffusing dopant impurities into the layer 16 (see column 5, lines 12-24). However, the Cook reference does not disclose or suggest forming a base region using epitaxial growth technology while adding dopant during epitaxial growth so as to obtain the second conductivity type. Consequently, it is respectfully submitted that the Cook reference does not anticipate new independent claim 12.

The Kawakatsu reference discloses a method of fabricating a semiconductor integrated circuit device, but also does not disclose or suggest manufacturing a semiconductor device including forming a base region using epitaxial growth technology while adding dopant during epitaxial growth so as to obtain the second conductivity type. Therefore, one of ordinary skill in the art would not be motivated by the Kawakatsu reference to modify the Cook reference or to combine the references in a manner that would result in the invention of independent claim 12. Accordingly, it is respectfully submitted that independent claim 12 and the claims that depend therefrom are clearly patentable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is

now in condition for allowance. However, if the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the Applicant's undersigned representative.

Respectfully submitted,

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